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In view of the above, according to this Embodiment 9, the coding ability changing parts 67 and 68 change the control signals indicating the coding systems of the facsimile terminals 21 and 32 from the two-dimensional to the one-dimensional coding system (The one-dimensional coding system is adopted when the control signal for either one of the facsimile terminals 21 and 32 indicates the use of the one-dimensional coding system).

The one-dimensional coding system mentioned herein is a system that encodes facsimile signals every line.

As is evident from the above, according to this Embodiment 9, since the coding system of the facsimile terminals 21 and 32 is switched from the two-dimensional to the one-dimensional coding system, the influence of the discarded facsimile signal is localized, and as a result, the preceding and succeeding facsimile signals are free from the influence of the discarded facsimile signal—this permits further reduction of image degradation than in the case of using the two-dimensional coding system.

EMBODIMENT 10

FIG. 15 is a block diagram illustrating a facsimile signal transmitting device according to Embodiment 10 of the present invention. In FIG. 15 the same reference numerals as those in FIG. 14 denote the parts identical with or corresponding to those used therein; hence, no description will be repeated in connection with them.

Reference numeral 69 denotes a minimum scanning time capacity changing part (sending means) whereby a control signal indicating the minimum scanning time of the facsimile terminal 21, contained in a facsimile signal, is changed; and 70 denotes a minimum scanning time capacity changing part (sending means) common in function to the minimum scanning time capacity changing part 69.

Next, the operation of this embodiment will be described below.

While Embodiment 9 has been described above to change the coding system of the facsimile terminals 21 and 32, it is also possible to change the minimum scanning time capacity of the facsimile terminals 21 and 32.

That is, the minimum scanning time capacity is a capacity that represents the image data processing time per line (processing time for decoding, processing time for printing, and so forth) at the facsimile terminals 21 and 32. When the image data transmitting time is shorter than such a processing time, processing of each line cannot be completed in time.

For example, when the processing time per line is 20 msec, the above-mentioned problem will arise if the image data transmitting time is shorter than 20 msec.

In view of the above, when the time taken to transmit image data of one line is shorter than the minimum scanning time, the facsimile terminals 21 and 32 usually transmit the image data after adding thereto fill data so that the image data transmitting time becomes equal to or longer than the minimum scanning time.

In concrete terms, the minimum scanning time capacity changing parts 69 and 70 lengthen the minimum scanning time by suitably changing the control signal representative of the minimum scanning time.

This scheme increases the number of pieces of data transmitted per line, and hence localizes the influence of the discarded facsimile signal, permitting further reduction of image degradation as compared with Embodiment 1 and other embodiments.

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EMBODIMENT 11

Although Embodiments 1 through 10 have been described above to have both of sending and receiving means, they may also have only either one of the sending and receiving means.

INDUSTRIAL APPLICABILITY

As described above, the facsimile signal transmitting device and the facsimile signal transmitting method according to the present invention are suitable for improving the facsimile signal transmission efficiency in the transmission of facsimile signals over an ATM network, packet communication network or the like.

What is claimed is:

1. A facsimile signal transmitting device comprising: first storage means for storing therein facsimile signals provided from a transmitting facsimile terminal; transmitting means for generating frame data by combining the current facsimile signals provided from said transmitting facsimile terminal and the previous facsimile signals stored in said first storage means and for outputting said frame data onto a transmission line; receiving means for receiving said frame data when it is provided by said transmitting means onto said transmission line and for disassembling said frame data into a plurality of facsimile signals; second storage means for storing therein said plurality of facsimile signals disassembled by said receiving means; and signal selecting means which, when receiving a frame detection signal indicating that said frame data provided on said transmission line has been transmitted without being discarded during transmission, supplies a receiving facsimile terminal with the oldest one of said plurality of facsimile signals disassembled by said receiving means and, when receiving a frame detection signal indicating that said frame data was discarded during transmission, supplies said receiving facsimile terminal with a facsimile signal corresponding to the oldest one of said facsimile signals stored in said second storage means.

2. A facsimile signal transmitting device as recited in claim 1, characterized in that, when outputting said facsimile signals onto said transmission line, said transmitting means adds a concerned one of said facsimile signals with a control signal indicating the use of a first-dimensional coding method (MH coding method) as the coding system of said facsimile terminals.

3. A facsimile signal transmitting device as recited in claim 1, characterized in that, when outputting said facsimile signals onto said transmission line, said transmitting means adds a concerned one of said facsimile signals with a control signal indicating the minimum scanning time of said facsimile terminals while at the same time suitably changing said minimum scanning time.

4. A facsimile signal transmitting device comprising: compressing means for data compressing facsimile signals provided from a transmitting facsimile terminal; first storage means for storing therein said facsimile signals compressed by said compressing means; sending means for generating frame data by combining the current facsimile signals compressed by said compressing means and the previous facsimile signals stored in said first storage means and for outputting said frame data onto a transmission line; receiving means for receiving said frame data when it is provided by said transmitting means onto said transmission line and for disassembling said frame data into a plurality of facsimile signals; expanding means for data expanding said plurality of facsimile signals disassembled by said receiving

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means; second storage means for storing therein said plurality of facsimile signals expanded by said expanding means; and signal selecting means which, when receiving a frame detection signal indicating that said frame data provided on said transmission line has been transmitted without being discarded during transmission, supplies a receiving facsimile terminal with the oldest one of said plurality of facsimile signals expanded by said expanding means and, when receiving a frame detection signal indicating that said frame data was discarded during transmission, supplies said receiving facsimile terminal with a facsimile signal corresponding to the oldest one of said facsimile signals stored in said second storage means.

5. A facsimile signal transmitting device comprising: transmitting means for outputting onto a transmission line facsimile signals provided from a transmitting facsimile terminal; receiving means for receiving said facsimile signals when they are provided by said transmitting means onto said transmission line; and signal selecting means which, when receiving a frame detection signal indicating that said facsimile signals provided on said transmission line have been transmitted without being discarded during transmission, supplies a receiving facsimile terminal with said facsimile signals received by said receiving means and, when receiving a frame detection signal indicating that said facsimile signals were discarded during transmission, supplies said receiving facsimile terminal with dummy data.

6. A facsimile signal transmitting device as claimed in claim 5, characterized in that said signal selecting means outputs fill data as said dummy data.

7. A facsimile signal transmitting device as claimed in claim 5, characterized in that said signal selecting means outputs white line data as said dummy data.

8. A facsimile signal transmitting device comprising: transmitting means for outputting onto a transmission line facsimile signals provided from a transmitting facsimile terminal; receiving means for receiving said facsimile signals when they are output by said transmitting means onto said transmission line; storage means for storing therein said facsimile signals received by said receiving means; and signal selecting means which, when receiving a frame detection signal indicating that said facsimile signals provided on said transmission line have been transmitted without being discarded during transmission, supplies a transmitting facsimile terminal with said facsimile signals received by said receiving means and, when receiving a frame detection signal indicating that said facsimile signals were discarded during transmission, supplies said receiving facsimile terminal with previous facsimile signals stored in said storage means.

9. A facsimile signal transmitting device comprising: transmitting means for outputting onto a transmission line facsimile signals provided from a transmitting facsimile terminal; receiving means for receiving said facsimile signals when they are output onto said transmission line by said transmitting means; detecting means for detecting an end of line code of each of said facsimile signals received by said receiving means; and signal selecting means which, when receiving a frame detection signal indicating that said facsimile signals provided on said transmission line have been transmitted without being discarded during transmission, supplies a receiving facsimile terminal with said facsimile signals received by said receiving means and, when receiving a frame detection signal indicating that said facsimile signals were discarded during transmission, inserts predetermined line data between said end of line codes of said facsimile signals detected by said detecting means and

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supplies said receiving facsimile terminal with said facsimile signals having said line data inserted between their end of line codes.

10. A facsimile signal transmitting device as recited in claim 9, characterized in that said signal selecting means inserts fill data as said predetermined line data.

11. A facsimile signal transmitting device as recited in claim 9, characterized in that said signal selecting means inserts white line data as said predetermined line data.

12. A facsimile signal transmitting device as recited in claim 9, characterized in that said signal selecting means inserts, as said predetermined line data, previous or succeeding facsimile signals received.

13. A facsimile signal transmitting method wherein: facsimile signals output from a transmitting facsimile terminal are stored; current facsimile signals from said transmitting facsimile terminal and preceding facsimile signals are combined into frame data; said frame data is output onto a transmission line; when provided onto said transmission line, said frame data is received and disassembled into a plurality of facsimile signals; said plurality of facsimile signals are stored; when a frame detection signal is received which indicates that said frame data provided on said transmission line has been transmitted without being discarded during transmission, the oldest one of said plurality of disassembled facsimile signals is output to a receiving-side facsimile terminal; and when a frame detection signal is received which indicates that said frame data was discarded during transmission, a facsimile signal corresponding to the oldest one of said stored facsimile signals is output to said receiving facsimile terminal.

14. A facsimile signal transmitting method as recited in claim 13, characterized in that when said facsimile signals are output onto said transmission line, a control signal indicating the use of a first-dimensional coding method (MH coding method) as the coding system of said facsimile terminals is added to said facsimile signals.

15. A facsimile signal transmitting method as recited in claim 13, characterized in that when said facsimile signals are output onto said transmission line, a control signal indicating the minimum scanning time of said facsimile terminals is added to said facsimile signals and said minimum scanning time is suitably changed.

16. A facsimile signal transmitting method wherein: facsimile signals output from a transmitting facsimile terminal are data compressed and stored; the current and previous compressed facsimile signals are combined into frame data; said frame data is output onto a transmission line; when output onto said transmission line, said frame data is received and disassembled into a plurality of facsimile signals; said plurality of facsimile signals are data expanded and stored; when a frame detection signal is received which indicates that said frame data provided on said transmission line has been transmitted without being discarded during transmission, the oldest one of said plurality of expanded facsimile signal is output to a receiving facsimile terminal; and when a frame detection signal is received which indicates that said frame data was discarded during transmission, a facsimile signal corresponding to the oldest one of said stored facsimile signal is output to said receiving facsimile terminal.

17. A facsimile signal transmitting method wherein: facsimile signals provided from a transmitting facsimile terminal are output onto a transmission line; when output onto said transmission line, said facsimile signals are received; when a frame detection signal is received which indicates said facsimile signals provided on said transmission line

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have been transmitted without being discarded during transmission, said received facsimile signals are output to a receiving facsimile terminal; and when a frame detection signal is received which indicates that said facsimile signals were discarded during transmission, dummy data is output to said receiving facsimile terminal.

18. A facsimile signal transmitting method as recited in claim 17, characterized in that fill data is output as said dummy data which is provided to said receiving facsimile terminal.

19. A facsimile signal transmitting method as recited in claim 17, characterized in that white line data is output as said dummy data which is provided to said receiving facsimile terminal.

20. A facsimile signal transmitting method wherein: facsimile signals provided from a transmitting facsimile terminal are output onto a transmission line; when output onto said transmission line, said facsimile signals are received and stored; when a frame detection signal is received which indicates that said facsimile signals provided on said transmission line have been transmitted without being discarded during transmission, said received facsimile signals are output to a receiving facsimile terminal; and when a frame detection signal is received which indicates that said facsimile signals were discarded during transmission, facsimile signals stored previously are output to said receiving facsimile terminal.

21. A facsimile signal transmitting method wherein: facsimile signals provided from a transmitting facsimile terminal

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are output onto a transmission line; when output onto said transmission line, said facsimile signals are received; and when a frame detection signal is received which indicates that said facsimile signals provided on said transmission line have been transmitted without being discarded during transmission, said received facsimile signals are output to a receiving facsimile terminal; and when a frame detection signal is received which indicates that said facsimile signals were discarded during transmission, end of line codes of said received facsimile signals are detected, then predetermined line data is inserted between said end of line codes of said received facsimile signals, and said facsimile signals with said line data inserted between their end of line codes are output to said receiving facsimile terminal.

22. A facsimile signal transmitting method as recited in claim 21, characterized in that fill data is inserted as said predetermined line data.

23. A facsimile signal transmitting method as recited in claim 21, characterized in that white line data is inserted as said predetermined line data.

24. A facsimile signal transmitting method -as recited in claim 21, characterized in that a facsimile signal received previously or succeeding is inserted as said predetermined line data.

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